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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Koji Naito et al.

Application No.: 09/820,688

Filed: March 30, 2001

For: IMAGE PROCESSING
APPARATUS, IMAGE FORMING
APPARATUS, INFORMATION
EMBEDDING METHOD, AND
INFORMATION EMBEDDING
PROGRAM

) MAIL STOP

) APPEAL BRIEF - PATENTS

) Group Art Unit: 2625

) Examiner: JAMES A THOMPSON

) Appeal No.: _____

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated December 21, 2009 rejecting claims 1, 3-7, 9-13, 15-20 and 22-29, which are reproduced as the Claims Appendix of this brief.

☒ Charge ☐ \$ 270 ☒ \$ 540 to Credit Card. Form PTO-2038 is attached.

The Commissioner is hereby authorized to charge any additional fees under 37 C.F.R. §§1.17, and 41.20 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

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I. Real Party in Interest

Minolta Co., Ltd. is the real party in interest, and is the assignee of Application No. 09/820,688.

II. Related Appeals and Interferences

The Appellant's legal representative, or assignee, does not know of any other appeal, interferences or judicial proceedings which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

The application contains claims 1-29. Claims 2, 8, 14, 21 have been canceled. Claims 1, 3-7, 9-13, 15-20 and 22-29 are pending in the present application. Claims 1, 3-7, 9-13, 15-20 and 22-29 have been at least twice rejected, and are being appealed.

IV. Status of Amendments

No claim amendments were submitted subsequent to the final Office Action dated March 10, 2009.

V. Summary Claimed Subject Matter

The claimed subject matter is directed to image processing of detecting, analyzing, updating or adding additional information embedded in image data.

Pursuant to 37 C.F.R. §41.37(1)(c)(v), the subject matter of independent claims 1, 7, 13 and 20 is cross-referenced to the specification and/or drawing figures in the following table. The following table is not to be construed as a representation

that the portions of the disclosure identified below constitute the sole basis for support for the claimed subject matter.

Claim	Disclosure
1. An image processing apparatus comprising:	
a detecting unit that detects all pieces of additional information that are embedded in image data;	page 13, the first and second paragraphs; Fig. 2, 202
a storage unit that stores the detected pieces of additional information in association with location information thereof;	page 23, the first full paragraph; Fig. 2, 212
an analyzing unit that analyzes the detected pieces of additional information and judges whether any of the detected pieces of additional information includes predetermined information that is updateable; and	page 14, the first full paragraph; Fig. 2, 208
an embedding unit that	page 12, the second full paragraph; Fig. 2, 206
(1) updates, when a judgment result of the analyzing unit is affirmative, the predetermined information included in the piece of additional information, and embeds the piece of additional information including the updated predetermined information into the image data at a location where the piece of additional information is originally embedded, by referring to the stored location information, and	page 15, the last paragraph – page 17, the first full paragraph; Fig. 2, 206 and 208
(2) embeds, when the judgment result of the analyzing unit is negative, a new piece of additional information including updated information into the image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored	page 15, the last paragraph – page 17, the first full paragraph; Fig. 2, 206 and 208

location information, the updated information being equivalent to the predetermined information.	
7. An image forming apparatus equipped with an image processing apparatus that processes inputted first image data so as to output second image data, the image forming apparatus forming an image according to the second image data,	
the image processing apparatus comprising:	
a detecting unit that detects all pieces of additional information that are embedded in the first image data;	page 13, the first and second paragraphs, Fig. 2, 202
a storage unit that stores the detected pieces of additional information in association with location information thereof;	page 23, the first full paragraph; Fig. 2, 212
an analyzing unit that analyzes the detected pieces of additional information and judges whether any of the detected pieces of additional information includes predetermined information that is updateable; and	page 14, the first full paragraph; Fig. 2, 208
an embedding unit that	page 12, the second full paragraph; Fig. 2, 206
(1) updates, when a judgment result of the analyzing unit is affirmative, the predetermined information included in the piece of additional information, and embeds the piece of additional information including the updated predetermined information into the first image data at a location where the piece of additional information is originally embedded, by referring to the stored location information, and	page 15, the last paragraph – page 17, the first full paragraph; Fig. 2, 206 and 208
(2) embeds, when the judgment result of the analyzing unit is negative, a new piece of additional	page 15, the last paragraph – page 17, the first full

information including updated information into the first image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored location information, the updated information being equivalent to the predetermined information,	paragraph; Fig. 2, 206 and 208
wherein the first image data embedded with the updated predetermined information and/or the new piece of additional information is outputted as the second image data.	page 25, the first paragraph, Figs. 5B and 6B
13. A method for embedding additional information in image data comprising:	
a first step of detecting all pieces of additional information that are embedded in the image data;	the paragraph bridging pages 18 and 19, Fig. 3, S3
a second step of storing the detected pieces of additional information in association with location information thereof;	page 23, the first full paragraph; Fig. 2, 212
a third step of analyzing the detected pieces of additional information and judging whether any of the detected pieces of additional information includes predetermined information that is updateable;	page 19, the first and second paragraphs, Fig. 3, S5 and S8
a fourth step of updating, when a judgment result in the third step is affirmative, the predetermined information included in the piece of additional information, and embedding the piece of additional information including the updated predetermined information into the image data at a location where the piece of additional information is originally embedded, by referring to the stored location information, and	page 20, the first paragraph, Fig. 3, S9

a fifth step of embedding, when the judgment result in the third step is negative, a new piece of additional information including updated information into the image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored location information, the updated information being equivalent to the predetermined information.	page 21, the last paragraph – page 24, the first full paragraph, Fig. 3, S12-S16 and Fig. 4, S101 and S102
20. A computer-readable medium containing a program that is executed by a computer, the program making the computer function as the following:	
a detecting means for detecting all pieces of additional information that are embedded in image data;	page 13, the first and second paragraphs, Fig. 2, 202
a storing means for storing the detected pieces of additional information in association with location information thereof;	page 23, the first full paragraph; Fig. 2, 212
an analyzing means for analyzing the detected pieces of additional information and judging whether any of the detected pieces of additional information includes predetermined information that is updateable; and	page 14, the first full paragraph; Fig. 2, 208
an embedding means for	page 12, the second full paragraph; Fig. 2, 206
(1) updating, when a judgment result of the analyzing means is affirmative, the predetermined information included in the piece of additional information, and embedding the piece of additional information including the updated predetermined information into	page 15, the last paragraph – page 17, the first full paragraph; Fig. 2, 206 and 208

the image data at a location where the piece of additional information is originally embedded, by referring to the stored location information, and	
(2) embedding, when the judgment result of the analyzing means is negative, a new piece of additional information including updated information into the image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored location information, the updated information being equivalent to the predetermined information.	page 15, the last paragraph – page 17, the first full paragraph; Fig. 2, 206 and 208

VI. Grounds of Rejection to be Reviewed on Appeal

The Office Action dated December 21, 2009 presents following obviousness rejections for review on appeal:

claims 1, 3, 5-7, 9, 11-13, 15, 17-20, 22 and 24-29 are rejected under 35 U.S.C. §103(a) over U.S. Patent No. 5,987,127 to Ikenoue et al (hereinafter "Ikenoue") in view of U.S. Patent No. 6,055,321 to Numao (hereinafter "Numao"); and

claims 4, 10, 16 and 23 are rejected under 35 U.S.C. § 103(a) over Ikenoue, Numao and further in view of U.S. Patent No. 3,760,159 to Davis (hereinafter "Davis").

VII. Argument

Exemplary Embodiments of the Present Invention

According to exemplary embodiments of the present invention, continuity of updateable additional information embedded in an image for subsequent image output is maintained by embedding updated additional information in an output of this image. Figs. 5A and 5B illustrate an example of an input image including pieces of additional information, and an output image after pieces of updated additional information has been embedded. As shown in Fig. 5A, the area a1 is embedded with information showing a copy creation date, the areas a2 and a3 are respectively embedded with unanalyzable additional information A and unanalyzable additional information B, and the area a4 is embedded with character information "IMPORTANT." Among these pieces of additional information, only the copy creation date is updateable. Therefore, the copy creation date is updated to a date when the copy is made, for example, to 2000.3.24, as shown in Fig. 5B. In addition, as the input image does not include an apparatus identification number of the present copying machine, the apparatus identification number is embedded as new additional information into the area a5 that does not overlap the areas a1 to a4, as shown in Fig. 5B. It is noted that the present invention is not limited to the exemplary embodiments described above.

Claim 1

Claims 1, 3, 5-7, 9, 11-13, 15, 17-20, 22 and 24-29 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Ikenoue, in view of Numao. For at least the reasons noted below, this rejection should be reversed.

"location information thereof":

Claim 1 recites an image processing apparatus including a storage unit that stores the detected pieces of additional information in association with location information thereof. The "location information thereof" refers to information that identifies where (i.e., the location) in the image data the "additional information" is embedded.

It is asserted in the Office Action that Ikenoue discloses the above-recited features in Fig. 9. col. 7, lines 38-44 and col. 8, lines 38-43. Appellants respectfully disagree.

Fig. 9. col. 7, lines 38-44 and col. 8, lines 38-43 of Ikenoue relate to finding appropriate areas in an image to embed additional data to avoid noise. Ikenoue also discloses that if the length of the additional data is long, such data can be divided into multiple blocks to be embedded in the image. Ikenoue is concerned with finding locations for embedding additional data. However, Ikenoue does not disclose storing detected pieces of additional information *in association with location information thereof*. In Ikenoue, the additional information is stored with a "block number". See column 7, lines 41 - 43. However, the block number refers to the position "*in the additional data.*" In other words, the position denoted by the block number is the relative importance of the additional data. It has nothing to do with the location in the

image data in which the additional information is located. See column 7, lines 33 -

50 of Ikenoue:

The additional data have to be embedded by the image processors 100 and 101 in a modest way so that an ordinary man cannot recognize it. However, there may be a case wherein it is hard to embed the additional data in a hard copy in a modest way because the data length of the additional data shown in FIG. 4 is long. In order to overcome this situation, additional data can be divided into blocks of a predetermined data length for embedding the additional data block units of data in a hard copy. A block number is added to each data block in order to identify the position *in the additional data*. If it is difficult even to embed a block, *the order of superiority in the blocks are determined beforehand*, and blocks of inferior order are not embedded. In order to recover additional data from a hard copy, data from each data block with a block number are read, and the data are rearranged in the order of the block numbers to restore the additional data. Data from the blocks which are unable to be read are deleted from the restored additional data. (emphasis added)

At least for this reason, an image processing apparatus including a storage unit that stores the detected pieces of additional information in association with location information thereof, as described in claim 1, is not taught by Ikenoue.

"updated information":

Claim 1 further recites an embedding unit that embeds, when the judgment result of the analyzing unit is negative, a new piece of additional information including ***updated information*** into the image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored location information, the updated information being equivalent to the predetermined information. In the preferred embodiment, this feature is illustrated in Figs. 5A and 5B, wherein Fig. 5A of the present application illustrates an input image before pieces of additional information are extracted. Fig. 5B illustrates an output image after an image processing unit has embedded new

pieces of additional information. Referring to Figs. 5A and 5B, the input image does not include predetermined information of an apparatus identification number of the present copying machine. Accordingly, the apparatus identification number is embedded as new additional information into the area a5 that does not overlap the areas a1 to a4, as shown in Fig. 5B.

The Office Action acknowledges that this feature is not taught by Ikenoue.

It is asserted in the Office Action that Numao in Fig. 5, and col. 8, line 56 - col. 9, line 12, discloses embedding, when the judgment result of the analyzing unit is negative, a new piece of additional information including updated information into the image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored location information, the updated information being equivalent to the predetermined information. See the Office Action, page 4, the last paragraph. Appellants respectfully disagree.

Numao discloses a data hiding method of dispersing message data (e.g., a message "datahiding," as shown in Fig. 5) in media data (e.g., image data, as shown in Fig. 1, or Fig. 5) to prevent a third person from modifying the message data easily. According to the data hiding method in Numao, the media data is expressed as a media array while the message data is expressed as a message array so that the array elements of the message array can be dispersively hidden in the media array based on a state value specifying a particular array element of the media array.

Fig. 5 of Numao is a schematic drawing describing hiding a message "datahiding" in the image stored in the media array M. Media array value $M[0]$ is taken from position p_0 of the image, as shown in Fig. 5. Then, the exclusive OR of message array value $m[0]$ and the media array value $M[0]$, as shown in Fig. 5, is determined, and the result is hidden in position p_1 . See Numao: col. 8, lines 64-66.

This hiding operation changes contents of media array value $M[p_1]$. Furthermore, as the processing at position p_2 , the exclusive OR of message array value $m[1]$ and media array value $M[1]$, the contents of which have been changed by the preceding processing, is determined, and the result is hidden in position p_2 . See Numao: col. 9, lines 1-5. Data hiding is completed by repeating such hiding processing until position p_{10} . The exclusive OR of the message array value $m[9]$ and the media array value $M[9]$, the contents of which have been changed by the preceding processing is hidden in the position p_{10} .

According to Numao, the message data that is going to be added to the media data is stored in the message array, and does not change. Numao does not disclose that the message data is additional information that includes predetermined information ***that is updatable***, as described in claim 1.

In Numao, the message data hidden according to the above-described process is merely extracted. Numao does not disclose analyzing the extracted message data to determine whether the extracted message data contains predetermined information including updatable information. Therefore, Numao does not disclose an image processing apparatus including an embedding unit that embeds, when the judgment result of the analyzing unit judging whether any of the detected pieces of additional information includes predetermined information that is updateable is negative, a new piece of additional information including updated information into the image data, as described in claim 1.

In addition, since Numao does not disclose that the message data is updatable data, Numao could not disclose embedding updated information that is equivalent to a predetermined information in the image data, as described in claim 1.

Furthermore, Numao only discloses an algorithm that determines respective locations in the media data for each element of the message array. Numao does not disclose detecting existing message data before embedding a new message.

Nowhere does Numao disclose finding a location that does not overlap locations where detected pieces of existing messages are embedded. Therefore, Numao does not disclose an embedding unit that embeds, when the judgment result of the analyzing unit is negative, a new piece of additional information including updated information into the image data at a location that does not overlap locations where the detected pieces of additional information are embedded, as described in claim 1.

Finally, Numao is not related to updating the message data in the media data. Instead, Numao is concerned with inserting a static message at certain locations of the media data. Numao does not disclose embedding a new message by referring to location information in association with the existing message data that is stored in a storage unit. Therefore, Numao does not disclose an image processing apparatus comprising an embedding unit that embeds a new piece of additional information including updated information into the image data by referring to the stored location information, as described in claim 1.

In view of the foregoing, claim 1 is patentable. Claims 3, 5 and 6 are patentable at least because of their dependency from claim 1. Claims 7, 9, 11-13, 15, 17-20, 22, 24-27 and 29 are patentable at least because they include distinguishing features similar to those of claim 1.

Claim 4

Claims 4, 10, 16 and 23 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Ikenoue in view of Numao and Davis (U.S. Patent No. 3,760,159, hereinafter "Davis").

Claim 4 recites a warning unit that issues, when the analyzing unit finds that any of the detected pieces of additional information is unanalyzable, a warning to the effect that the piece of additional information is unanalyzable.

The Office Action acknowledges that Ikenoue and Numao do not disclose the above-recited features. Col. 5, lines 64-68 and col. 6, lines 16-20 in Davis are relied upon as allegedly disclosing such features. Appellants respectfully disagree.

Davis discloses a warning if a valid parity does not exist in converting an electrical signal to Binary Coded Decimal (BCD) data. See Davis: the abstract and col. 6, lines 16-20.

It is not understood how issuing a warning when error is encountered during converting of an electrical signal to BCD data corresponds to issuing a warning when a piece of additional information data embedded in an image data is not analyzable. The Examiner asserts that it would have been obvious to a person of ordinary skill in the art to display a warning if the digital data cannot be read properly, as disclosed in Davis.

Appellants submit that Davis is not related to reading digital data, as asserted by the Examiner. Instead, Davis is concerned with converting the electrical signal to BCD data, which is a problem of entirely different nature from reading digital signal. Davis is not concerned with reading or analyzing data. Accordingly, does not disclose issuing warning when a piece of data is not analyzable, as described in claim 4.

Furthermore, Davis does not remedy the deficiencies of Ikenoue and Numao.

In view of foregoing, claim 4 is patentable. Claims 10, 16 and 23 are patentable at least because they include distinguishing features similar to claim 4.

VIII. Claims Appendix

See attached Claims Appendix for a copy of the claims involved in the appeal.

IX. Evidence Appendix

None

X. Related Proceedings Appendix

None

XI. Conclusion

As demonstrated in the foregoing arguments, the cited references do not disclose each feature recited in the claims. The rejections are not properly supported in the statute, and should be reversed.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date May 21, 2010

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VIII. CLAIMS APPENDIX

The Appealed Claims

1. An image processing apparatus comprising:
 - a detecting unit that detects all pieces of additional information that are embedded in image data;
 - a storage unit that stores the detected pieces of additional information in association with location information thereof;
 - an analyzing unit that analyzes the detected pieces of additional information and judges whether any of the detected pieces of additional information includes predetermined information that is updateable; and
 - an embedding unit that
 - (1) updates, when a judgment result of the analyzing unit is affirmative, the predetermined information included in the piece of additional information, and embeds the piece of additional information including the updated predetermined information into the image data at a location where the piece of additional information is originally embedded, by referring to the stored location information, and
 - (2) embeds, when the judgment result of the analyzing unit is negative, a new piece of additional information including updated information into the image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored location information, the updated information being equivalent to the predetermined information.

3. The image processing apparatus according to Claim 1,
wherein when the analyzing unit analyzes the detected pieces of additional information, the analyzing unit employs a predetermined embedding format used by the embedding unit.

4. The image processing apparatus according to Claim 1, further comprising,
a warning unit that issues, when the analyzing unit finds that any of the detected pieces of additional information is unanalyzable, a warning to the effect that the piece of additional information is unanalyzable.

5. The image processing unit according to Claim 1,
wherein when the analyzing unit finds that any of the detected pieces of additional information is unanalyzable, the analyzing unit judges that the piece of additional information does not include the predetermined information.

6. The image processing apparatus according to Claim 1,
wherein the predetermined information includes information about a date when the image data is processed.

7. An image forming apparatus equipped with an image processing apparatus that processes inputted first image data so as to output second image data, the image forming apparatus forming an image according to the second image data,

the image processing apparatus comprising:

a detecting unit that detects all pieces of additional information that are embedded in the first image data;

a storage unit that stores the detected pieces of additional information in association with location information thereof;

an analyzing unit that analyzes the detected pieces of additional information and judges whether any of the detected pieces of additional information includes predetermined information that is updateable; and

an embedding unit that

(1) updates, when a judgment result of the analyzing unit is affirmative, the predetermined information included in the piece of additional information, and embeds the piece of additional information including the updated predetermined information into the first image data at a location where the piece of additional information is originally embedded, by referring to the stored location information, and

(2) embeds, when the judgment result of the analyzing unit is negative, a new piece of additional information including updated information into the first image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored location information, the updated information being equivalent to the predetermined information,

wherein the first image data embedded with the updated predetermined information and/or the new piece of additional information is outputted as the second image data.

9. The image forming apparatus according to Claim 7,

wherein when the analyzing unit analyzes the detected pieces of additional information, the analyzing unit employs a predetermined embedding format used by the embedding unit.

10. The image forming apparatus according to Claim 7,
wherein the image processing apparatus further comprises,
a warning unit that issues, when the analyzing unit finds that any of the detected pieces of additional information is unanalyzable, a warning to the effect that the piece of additional information is unanalyzable.

11. The image forming apparatus according to Claim 7,
wherein when the analyzing unit finds that any of the detected pieces of additional information is unanalyzable, the analyzing unit judges that the piece of additional information does not include the predetermined information.

12. The image forming apparatus according to Claim 7,
wherein the predetermined information includes information about a date when the image data is processed.

13. A method for embedding additional information in image data comprising:
a first step of detecting all pieces of additional information that are embedded in the image data;
a second step of storing the detected pieces of additional information in association with location information thereof;

a third step of analyzing the detected pieces of additional information and judging whether any of the detected pieces of additional information includes predetermined information that is updateable;

a fourth step of updating, when a judgment result in the third step is affirmative, the predetermined information included in the piece of additional information, and embedding the piece of additional information including the updated predetermined information into the image data at a location where the piece of additional information is originally embedded, by referring to the stored location information, and

a fifth step of embedding, when the judgment result in the third step is negative, a new piece of additional information including updated information into the image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored location information, the updated information being equivalent to the predetermined information.

15. The method for embedding additional information in image data according to Claim 13,

wherein when the detected pieces of additional information are analyzed in the third step, a predetermined embedding format used for embedding the piece of additional information in the fourth step and the new piece of additional information in the fifth step is employed.

16. The method for embedding additional information in image data according to Claim 13, further comprising,

a warning step of issuing, when any of the detected pieces of additional information is judged to be unanalyzable in the third step, a warning to the effect that the piece of additional information is unanalyzable.

17. The method for embedding additional information in image data, according to Claim 13,

wherein when any of the detected pieces of additional information is judged to be unanalyzable in the third step, the piece of additional information is judged not to include the predetermined information.

18. The method for embedding additional information in image data according to Claim 13,

wherein the predetermined information includes information about a date when the image data is processed.

19. The method for embedding additional information in image data according to Claim 13, further comprising,

a step of forming an image according to the image data that includes one of (a) the updated predetermined information embedded in the fourth step and (b) the new piece of additional information embedded in the fifth step.

20. A computer-readable medium containing a program that is executed by a computer, the program making the computer function as the following:

a detecting means for detecting all pieces of additional information that are embedded in image data;

a storing means for storing the detected pieces of additional information in association with location information thereof;

an analyzing means for analyzing the detected pieces of additional information and judging whether any of the detected pieces of additional information includes predetermined information that is updateable; and

an embedding means for

(1) updating, when a judgment result of the analyzing means is affirmative, the predetermined information included in the piece of additional information, and embedding the piece of additional information including the updated predetermined information into the image data at a location where the piece of additional information is originally embedded, by referring to the stored location information, and

(2) embedding, when the judgment result of the analyzing means is negative, a new piece of additional information including updated information into the image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored location information, the updated information being equivalent to the predetermined information.

22. The program according to Claim 20,

wherein when the analyzing means analyzes the detected pieces of additional information, the analyzing means employs a predetermined embedding format used by the embedding means.

23. The program according to Claim 20, making the computer further function as the following,

a warning means for issuing, when the analyzing means finds that any of the detected pieces of additional information is unanalyzable, a warning to the effect that the piece of additional information is unanalyzable.

24. The program according to Claim 20,
wherein when the analyzing means finds that any of the detected pieces of additional information is unanalyzable, the analyzing means judges that the piece of additional information does not include the predetermined information.

25. The program according to Claim 20,
wherein the predetermined information includes information about a date when the image data is processed.

26. An image processing apparatus comprising:
a detecting unit that detects additional information that is embedded in image data;
a storage unit that stores the detected additional information in association with location information thereof; and
an embedding unit that embeds new additional information in the image data at a location that does not overlap a location where the detected additional information is embedded, by referring to the stored location information.

27. A method for embedding additional information in image data, comprising:

a first step of detecting additional information that is embedded in image data;

a second step of storing the detected additional information in association with location information thereof; and

a third step of embedding new additional information into the image data at a location that does not overlap a location where the detected additional information is embedded, by referring to the stored location information.

28. A computer-readable medium containing a program that is executed by a computer, the program making the computer function as the following:

a detecting means for detecting additional information that is embedded in image data;

a storage means for storing the detected additional information in association with location information thereof; and

an embedding means for embedding new additional information into the image data at a location that does not overlap a location where the detected additional information is embedded, by referring to the stored location information.

29. An image processing apparatus comprising:

a detecting unit that detects all pieces of additional information that are embedded in image data;

a storage unit that stores the detected pieces of additional information, the storage unit also stores location information indicating the location of where the detected pieces of additional information are embedded within the image data;

an analyzing unit that analyzes the detected pieces of additional information and judges whether any of the detected pieces of additional information includes predetermined information that is updateable; and

an embedding unit that

(1) updates, when a judgment result of the analyzing unit is affirmative, the predetermined information included in the piece of additional information, and embeds the piece of additional information including the updated predetermined information into the image data at the location where the piece of additional information is originally embedded, by referring to the stored location information, and

(2) embeds, when the judgment result of the analyzing unit is negative, a new piece of additional information including updated information into the image data at a location that does not overlap locations where the detected pieces of additional information are embedded, by referring to the stored location information, the updated information being equivalent to the predetermined information.

IX. EVIDENCE APPENDIX

None

X. RELATED PROCEEDINGS APPENDIX

None